1. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x+2) - 5$$

A. $f^{-1}(7) \in [162750.79, 162754.79]$

B. $f^{-1}(7) \in [-0.61, 7.39]$

C. $f^{-1}(7) \in [143.41, 144.41]$

D. $f^{-1}(7) \in [162753.79, 162764.79]$

E. $f^{-1}(7) \in [8098.08, 8102.08]$

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2. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{2}{4x+21} \text{ and } g(x) = \frac{2}{6x-23}$$

A. The domain is all Real numbers except $x = a$, where $a \in [0.4, 11.4]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [1, 9]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.67, -2.67]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.25, -4.25]$ and $b \in [0.83, 7.83]$

E. The domain is all Real numbers.

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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 11$ and choose the interval that $f^-1(11)$ belongs to.

$$f(x) = \sqrt[3]{2x+3}$$

A. $f^{-1}(11) \in [663.3, 664.8]$

B. $f^{-1}(11) \in [664.9, 667.9]$

C. $f^{-1}(11) \in [-664.5, -661.8]$

D. $f^{-1}(11) \in [-669.6, -664.4]$

E. The function is not invertible for all Real numbers.

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4. Determine whether the function below is 1-1.

$$f(x) = -9x^2 + 15x + 234$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. Yes, the function is 1-1.

E. No, because there is a y-value that goes to 2 different x-values.

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5. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = x + 6 \text{ and } g(x) = \frac{1}{4x - 13}$$

A. The domain is all Real numbers except $x = a$, where $a \in [2.25, 6.25]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.4, -2.4]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.75, -2.75]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-12.33, 2.67]$ and $b \in [-8.67, -3.67]$

E. The domain is all Real numbers.

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6. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = e^{x-4} + 5$$

A. $f^{-1}(7) \in [6.02, 6.21]$

B. $f^{-1}(7) \in [4.66, 4.73]$

C. $f^{-1}(7) \in [7.35, 7.45]$

D. $f^{-1}(7) \in [-3.34, -3.28]$

E. $f^{-1}(7) \in [7.41, 7.5]$

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7. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 - 2x^2 + 2x \text{ and } g(x) = -2x^3 - 3x^2 + 3x + 1$$

A. $(f \circ g)(1) \in [-1.78, -0.74]$

B. $(f \circ g)(1) \in [2.64, 3.93]$

C. $(f \circ g)(1) \in [-6.26, -5.68]$

D. $(f \circ g)(1) \in [-2.2, -1.72]$

E. It is not possible to compose the two functions.

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8. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 12$ and choose the interval that $f^-1(12)$ belongs to.

$$f(x) = \sqrt[3]{3x + 4}$$

A. $f^{-1}(12) \in [574, 576.8]$

B. $f^{-1}(12) \in [577.3, 578.8]$

C. $f^{-1}(12) \in [-580.7, -574.7]$

D. $f^{-1}(12) \in [-575.6, -573.9]$

E. The function is not invertible for all Real numbers.

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9. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -3x^3 - 2x^2 + 3x + 4 \text{ and } g(x) = x^3 - 2x^2 + 3x$$

A. $(f \circ g)(1) \in [-30, -24]$

B. $(f \circ g)(1) \in [6, 11]$

C. $(f \circ g)(1) \in [-26, -20]$

D. $(f \circ g)(1) \in [-6, 1]$

E. It is not possible to compose the two functions.

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10. Determine whether the function below is 1-1.

$$f(x) = (4x + 13)^3$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. Yes, the function is 1-1.

D. No, because there is a y-value that goes to 2 different x-values.

E. No, because the range of the function is not $(-\infty, \infty)$.
